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Wisconsin, Virginia, California, Minnesota, Iowa, Maryland, Washington, Texas, and Florida.

The purpose of our work was to analyze the State's mechanisms for monitoring ongoing capital construction projects and gauge the processes used to compare upfront project assumptions against post-closeout results.

How were the results of the work measured?

We evaluated the State's mechanisms for monitoring ongoing capital construction projects and comparing up-front project assumptions against post-close out results. According to our industry experience, mechanisms for initiating and tracking project assumptions should include:

- Establishing mechanisms for tracking major lifecycle cost assumptions and monitoring, tracking, and reporting on these assumptions throughout the life of the project;
- Performing post-mortem analysis at project close-out of the assumptions made to justify the project and to identify lessons learned to be applied to future projects;
- Establishing mechanisms for tracking capital project expenditures against the original budget in total, as well as between expense categories;
- Developing a "business case" to support any major reallocation of funds between line items or for reinvesting project savings into additional construction upgrades or enhancements;
- Implementing mechanisms for tracking and reporting on any projected cost savings and assumptions against the baseline used to justify and support project approval;
- Executing the key agreements, such as leases, Memoranda of Understanding, and contracts, to ensure the estimates and assumptions supporting the project justifications can be successfully achieved; and
- Engaging independent third parties separate from the project management team and other third-party contractors involved in the project, to provide independent monitoring of large, complex projects and track expenditures and project assumptions.

What problem did the work identify?

Overall, we found inconsistent mechanisms for tracking, monitoring, and reporting on expenditures, project assumptions, and cost savings across agencies and projects and in some cases, these mechanisms do not appear to align with industry practices. We also found that, on the basis of the projects analyzed, the State does not engage third parties to provide independent monitoring of large construction projects and

the sampled agencies did not always perform post-mortem reviews to understand the validity of project assumptions at project closeout. Specifically:

- Monitoring of total project lifecycle costs and post-mortem review and reporting of major assumptions and estimates. We identified information indicating total project lifecycle cost monitoring and performance of postmortem review for only one of the four projects reviewed (the Institute of Behavioral Science Building). According to University of Colorado-Boulder staff, monitoring and reporting of total project lifecycle costs and underlying assumptions are standard practices for capital construction projects at the University. Additionally, University staff report that post-mortem reviews of costs and assumptions occur at project closeout. As noted previously, neither the Judicial Center nor the Capitol Complex Parking Garage projects had complete and updated total lifecycle costs available; the Judicial Department did not provide an updated total lifecycle cost analysis as part of its project justification for the Judicial Center and the Department of Personnel & Administration did not complete a capital construction request and project justification for the Capitol Complex Parking Garage. Additionally, construction was never approved for the Mixed-Use Building; therefore, no monitoring was required. Further, the Judicial Center is not yet complete, so no post mortem review would have yet occurred.
- Construction expenditure monitoring at the line-item level. We found inconsistencies in agency practices for monitoring expenditures for capital construction projects. Generally, most agency staff we interviewed reported that they tracked expenditures at a higher level and focused primarily on ensuring that total costs did not exceed the overall project budget. Further, staff reported that requests for change orders and movement of funds between expense line items did not always undergo a comprehensive business case analysis and review process before approval. For one project (the Judicial Center), cost savings on construction bonds were used to offset changes to the library space to provide for a Learning Center valued at \$2 million. The Learning Center was not contemplated as part of the original The \$2 million savings could not be used to repay project design. bondholders and the most appropriate alternative was to reinvest the savings in project improvements. However, we did not identify a business case analysis that was completed before reallocating the project savings into the addition rather than reallocating funds for other purposes. Best practices require presentation, review, and approval of a business case analysis before reinvesting project savings for new purposes not identified in the project plan. By contrast, expenditures for the Capitol Complex Parking Garage and the Institute of Behavioral Science Building appear to have been rigorously tracked against the budget and significant controls were in place to monitor change orders and movement of expenditures between expense categories.

The Institute of Behavioral Science Building at the University of Colorado-Boulder is a representative example of good construction oversight and the project also evidenced an established "business case" review and approval process for evaluating whether to reinvest cost savings from one area into upgrades or expansions in other areas. As noted previously, the Mixed-Use Building was never constructed.

• Mechanisms to monitor and track cost savings. The project justification for the Judicial Center included information projecting operational cost savings of \$60 million. The Judicial Department, however, lacked adequate baseline data and mechanisms for monitoring and tracking this cost savings assumption. During our evaluation, we requested documentation from the Judicial Department on its progress made towards achieving the \$60 million cost savings. After the end of our field work, the Judicial Department provided the following information:

Table 4 - Status of First-Year and 30-Year Savings Estimates for the Judicial Center as of October 2012					
	First-Year Savings Estimate at Project	Current First-Year Savings Estimate	30-Year Savings Estimate at Project Approval (2008)	Current 30- Year Savings Estimate	Notes
Component	Approval (2008)	Estimate	(2000)	Estimate	Market rental rates did not
Rent	\$2,900,000	\$-308,000	\$15,000,000	\$1,513,009	increase as expected
Utilities	504,000	504,000	15,000,000	15,120,000	To be determined after first year of operation
Utilities	304,000	304,000	13,000,000	10,22-,-	Security costs higher than
Staff and Operating	936,000	281,983	30,000,000	3,523,514	anticipated
TOTAL	\$4,340,000	\$477,983	\$60,000,000	\$20,156,523	
Source: Information provided by the Colorado Judicial Department.					

The table shows current projected savings of approximately \$20 million, or about \$40 million less than the initial savings estimated at project approval. It is important to note that the Judicial Department also provided information to offset the reduced savings figures detailed above. For example, State agency tenant rental costs will be almost \$3.50 per square feet lower than original estimates, due to lower construction costs, favorable financing, and larger than expected revenue from court fees. Further, the Judicial Department provided estimates of future lease cost avoidance of \$163 million over 30 years, assuming market rental rates increase as projected.

- **Execution of key agreements.** For the Judicial Center, key agreements crucial to achieving project assumptions were not executed timely. For example as of the end of our evaluation, leases with the tenant agencies, which were proposed by the project to document space plans and costs, were not in place. Since the lease captures the services the tenants will receive and the rent and expenses tenants will be paying, and since the revenue from the lease payments is also an important component of repayment of the construction bonds, the lease agreement should have been executed and finalized very soon after project initiation, well before any space or build-out costs were incurred. As another example, we found that no Memoranda of Understanding had been executed between the Judicial Branch and the tenant State agencies outlining agency commitments toward consolidating operations, streamlining or sharing functions, or reducing staff prior to beginning construction. Formalized agreements, executed early in project initiation, are crucial for documenting the parties' understandings related to achieving operational cost savings.
- Third-party resources for independent monitoring of large, complex **projects.** None of the projects evaluated made use of a third-party contractor, separate from the project team or other contracted resources, to independently monitor construction projects, track budgets and expenditures, and evaluate project assumptions. The Judicial Department did engage third-party contractors to assist with project planning and construction management; however, the contractors engaged did not include a third-party independent monitor. For large-scale projects involving significant expenditures, an independent third-party monitor can be a cost-effective option to help ensure adequate controls are in place to track project assumptions and prevent cost overruns. Independent third parties can provide an independent assessment of the documentation supporting change orders, increased space needs, reinvestment of project savings, and reallocation of expenditures between line items. Additionally, an independent third party can identify effective mechanisms for tracking and monitoring assumptions and help mitigate limited staff resources at agencies with specific construction or project management expertise. Large projects, such as the Judicial Center, are good candidates for engaging an independent third party for independent project monitoring and oversight.

Why did the problem occur?

Currently, no statute or policies require agencies to establish strong mechanisms for ongoing monitoring of capital construction projects. Specifically, with the exception of the Colorado Commission on Higher Education, which has promulgated policies requiring institutions to track and monitor lifecycle project costs during the entire economic life of a project, there are no requirements specifying that agencies must track and report on lifecycle costs. Additionally, there are no requirements for State agencies to monitor capital construction budget line-items, make the business case before reallocating funds or reinvesting project savings, monitor and track cost savings against baseline estimates, or compare up-front project assumptions against post-close out results. Further, there are no requirements establishing criteria for when independent third parties should be engaged to monitor and track complex, high-cost construction projects. Finally, there are no requirements for agencies to complete a post-mortem review of capital construction projects and report lessons learned so that the State, as a whole, can benefit and improve the development of cost assumptions for future capital construction projects.

The State Architect, who has authority to oversee and develop policies for construction project management for Executive Branch agencies, lacks authority to establish policies requiring lifecycle cost and project assumption monitoring. Additionally, the Colorado Commission on Higher Education, which is a planning and coordinating body, lacks clear authority to require institutions of higher education to establish specific mechanisms for tracking, monitoring, and reporting on project assumptions or to require post mortem review and reporting of project results.

Further, due to staff funding limitations, most State agencies (with the exception of institutions of higher education) appear to lack specialists to assist with tracking and monitoring major capital construction projects and assumptions. Our research indicated that some other states (including Virginia, Maryland, Minnesota, California, and Florida) overcome the lack of real estate expertise at the agency level by providing access to such personnel through an appropriately staffed centralized real estate function or by utilizing third-party independent contractors.

Establishing requirements in legislation that State agencies track, monitor, and report on their project assumptions beyond the initial capital project evaluation and justification process could provide valuable information to improve the capital construction process statewide. For example, results of post-closeout evaluations of projects, including assessments of the validity of project assumptions and lessons learned, could be incorporated in the database discussed in Recommendation No. 1 and used by other agencies when developing their capital construction requests, improving the information available to support decision-making.

The State Architect currently has authority to develop policies requiring State agencies to prepare project monitoring reports and thorough project closeout evaluations, including written assessments of lessons learned, during the project construction and administration phases. OSPB, with the assistance of the State Architect, could work with the General Assembly to propose legislation authorizing the State Architect to establish tracking, monitoring, and reporting standards for lifecycle costs and project assumptions that apply to Executive Branch agencies, including institutions of higher education. The General Assembly, during deliberations, could then consider the policy decision of whether to extend these monitoring requirements to all agencies statewide.

Why does this problem matter?

Tracking, monitoring, and reporting on capital construction projects may help the State understand how limited available funds are invested. Ongoing oversight could also help the State confirm that assumptions contained in the upfront project justifications are consistent with actual experience once projects are completed and operational. Strong tracking and monitoring mechanisms could result in better information to support future capital construction decisions and decrease the likelihood of missing key assumptions or understating the estimates presented during the project evaluation process.

Inconsistencies in capital construction project monitoring could result in significant cost implications for the State. As an example, the expectation that cost savings would occur through consolidating and reducing the operational costs of Judicial Branch agencies and the Attorney General's Office was a major justification for approving construction of the Judicial Center. As we have discussed, the Judicial Department could not provide an adequate basis for this savings estimate in the project analysis and has not taken sufficient steps during the project to establish appropriate tracking mechanisms to ensure consolidation occurs and cost savings are realized. Similarly, by not undertaking post-closeout analyses on completed capital construction, including evaluating major assumptions and estimates utilized in the project justification, incorrect or inconsistent decisions might occur on future projects. As noted previously, the State has appropriated a total of more than \$2.1 billion to capital projects from all funding sources, excluding cash-funded projects at institutions of higher education authorized since January 1, 2010, from Fiscal Years 2009 through 2013. Capital construction investments should be subject to the same level of focused review as other types of investments made by the State.